Distributed ReStart

DER Engagement Webinar 20/05/21 – Questions and Responses

Procurement and Compliance

In partnership with:

tnei

SP ENERGY NETWORKS

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Questions and responses from Slido and the Teams Chat

On 20th May 2021, Distributed ReStart Procurement and Compliance Workstream hosted a stakeholder engagement webinar aimed at Distributed Energy Resources (DERs). The aim of the session was to provide an overview of the proposed procurement process, functional requirements, rules of play and codes considerations.

Below are the responses to the questions asked during the session.

1. **What are your considerations on grid-forming renewables technologies in the future distributed black start (instead of using a synchronous generator)?**

   Our proposals are designed to be open to all technologies including converter-connected resources in both grid forming and grid following modes.

2. **Is Grid Forming Capability (GC0137) a sufficient standard for an anchor generator that is not a synchronous generator?**

   While the proposed GC0137 modification does cover some of the technical characteristics required for restoration, it does not cover all of the functional requirements we have specified for an anchor generator. For example, GC0137 does not explicitly require a self-starting capability.

3. **There is a gap between investing in controls and upgrades for an anchor generator and achieving certainty of black start revenue. Will NGESO support this phase?**

   We are still working through the settlements and funding process for DERs, our thinking is that the process will support capital investments similar to the current Black Start process. Those costs would be included in the overall assessment to achieve best value for end customers.

4. **How is the research on this project related to black start from renewables, e.g., offshore wind, at transmission level?**

   There are many parallels between this project and other activities on black start, particularly involving converter-based sources. The project team has links to various relevant activities and our own work has included engaging with Strathclyde University and Iberdrola Middle East on some of the technical issues. We are proposing a "bottom-up" means of restoring the electricity network that would be used in parallel with other means of transmission network restoration.

5. **How will black start from DER work with existing black start services?**

   We expect the future black start strategy to include a diversity of approaches including bottom-up methods utilising DER as well as more conventional top-down methods, although probably also using new resources like HVDC interconnectors. The approach of regularly reviewing national and regional strategies is explained in more detail in the process map recording that we have shared.

6. **Can you make available the planning scenarios that would lead up to Black Start being invoked, or if they're already published where they can be found? Thanks**
   To qualify that: I'm looking at the command and control aspects of invoking Black Start, which may be dependent on how we got there in the first place!

The ESO publishes its black start strategy & procurement strategy and other information but the detailed plans for command and control in the event of a black start being invoked are not shared, partly due to commercial sensitivity of the parties involved but also for security reasons. Detailed plans are in place with clear roles and responsibilities for all stakeholders. Electricity restoration services are tested for their capability as part of their contract and regular training is done across all parties to maintain readiness.

7. **Does the anchor generator by default have to be a synchronous generator or did you consider battery scenarios as well?**

   We have deliberately tried to define the functional requirements in a technology neutral way, so it is not just restricted to synchronous generators. In fact, we are planning for a battery-based restoration scenario to be tested in one of our live trials.

8. **How will the anchor generator & top up services be assessed together during procurement process?**

   The rules of play set out our current thinking on how DER in an area need to be combined to create a feasible DRZ. The procurement of anchor and top-up services will be interactive to some degree, as shown in our procurement process diagram, but we are still designing these processes and the details of the assessment criteria. The objective of our assessment will be to ensure that contracts are awarded based on technical capability and best value to deliver an effective combination of services in each DRZ.

9. **Where will the network be earthed during the initial phase of anchor generator start-up?**

   In the earliest stages earthing will have to be at the anchor generator site. The installation of a switchable earth connection is a necessary cost in establishing a new DRZ. As the restoration process proceeds the earth point will be switched to its usual position at Grid Supply Point at a suitable time.

10. **With respect to restoring the DRZ are you considering options for load management, i.e. industrial users not drawing power whilst the island is being established**

    Yes, firstly through the DNO simply making sensible choices in which substations and feeders get restored, but also through the possibility of demand customers providing top-up services that aid with block load pick up and frequency control.

11. **CUSC and Grid Code - will specific categories of participant be defined for this purpose?**

    We are considering the different options available for incorporating DER that provide black start services into the Grid Code. We have currently added the definition for an Anchor Provider, which includes all types of technology, as long as they meet the requirements. We are also using the Restoration Service Providers definition, which is a European term, to cover the top-up service providers.

12. **Will any tender evaluation criteria take into consideration the technical viability of a given solution in equal measure to the cost of delivery?**

    The evaluation will certainly involve both technical and commercial aspects but the exact weighting to be applied, i.e. whether it is 50/50 or something else, has not been decided. We hope to get insight into this issue in the test procurement exercise planned for later this year.

13. **Would a gas generator need on-site storage of e.g. LPG, or can reliance be placed on the gas grid?**

    Similar to the existing approach to black start, the detail of that reliability of fuel source would be for individual providers to explore and confirm. The project has not examined the specific issues of gas grid reliance in great depth. However, our understanding is that gas grid operators may offer varying levels of resilience depending on location.

14. **Traditional Black Start the existing providers have a commercial advantage as they have no need to invest in start-up generators. How will you avoid this for DER?**

    One of the primary drivers for this project is to expand the range of options available for Black Start and thereby open up the market for restoration services. The goal is to provide the required level of service at minimum cost to end customers. Our design is based on combining multiple resources, which could mean using smaller DER with self-start capability to re-energise larger DER and then to continue building a power island. This may offer a more cost-effective alternative to a single large provider with its own start-up generators.

15. **Will a Black Start plant need a G99 grid connection if connected to the DNO network or will the nature of this requirement necessitate an alternative code?**

    Similar to existing black start services, the proposal is that the codes will recognise the need for the service and specify various aspects of how it is delivered but will not mandate the required capability to be installed on all generators. The intention is to utilise as far as possible resources that are installed for other reasons, or where black start is only one of many services provided. As such, these resources will be expected to adhere to the normal grid connection requirements. However, providing Black Start services may require some additional capabilities.

16. **Is the scheme aimed more at diesel reciprocating power plants, with fast response and block load capability? Gas reciprocation peaking plants are limited on emissions (MCPD) and would struggle to block load or ramp up fast due to the lean air/fuel radio. Have you considered this? I can see this type of plant requiring 2 fuel run profiles; one for normal operation and for distributed re-start response.**

    The design is intended to be technology agnostic. We are facing the emissions issue in our live trials and our expectations would be that the environmental agencies will remain involved in the process. We would argue that Black Start is an exceptional circumstance and therefore the conditions to mitigate are treated in the same way – as exceptional. Although we must also recognise the need for testing of resources.

17. **How does the ESO's stated aim to operate carbon-neutral interact with the service requirements? Is system restoration excluded - fossil fuels can be used?**

    The ESO goal is for a net-zero system to be possible if that's what the market delivers. Market rules mean that the ESO does not directly favour different resources based on carbon impact. The same applies to restoration services. This project is part of the wide-ranging preparations for operating a net-zero system, but the choice of which resources are used will depend on the market. Our assessment criteria do not include consideration of carbon impact.

18. **How do you propose to protect against uncertainties within the network brought about through cold load pick-up?**

    Cold load pick-up was identified as an important issue early in the project. We propose to deal with it through a combination of good forecasting, appropriate decision making during the restoration process, the provision of responsive resources with adequate range, and the use of fast-acting real-time control systems where needed. Our reports contain further information, including details of our work on the requirements for a DRZ Control system.

19. **Modern gas plants using recips can offer the same level of performance as a diesel recip with lower emissions and greater fuel efficiency. We have modelled the black-start capability of gas recips and demonstrated their viability both technically and commercially.**

    We understand that DER technologies are developing all the time and new capabilities are emerging. That's why we have tried to specify requirements that are technology agnostic and able to make use of whatever technologies are available in a given area.